WHAT IS CLAIMED IS:

1. A piezocomposite, obtained by laminating and integrating a plurality of composite sheet units, each of which includes a resin layer and a plurality of sintered piezoelectric thin wires arranged in a uniform direction on a surface of the resin layer, so that the sintered piezoelectric thin wires are positioned between the resin layers, and cutting the same in a direction perpendicular to a lengthwise direction of the sintered piezoelectric thin wires.

2. The piezocomposite according to claim 1, wherein the composite sheet unit includes two resin layers and a plurality of sintered piezoelectric thin wires arranged in a uniform direction between the two resin layers.

3. The piezocomposite according to claim 1, wherein resin-impregnated-cured portions are present between the sintered piezoelectric thin wires.

4. The piezocomposite according to claim 1, wherein each resin layer is composed of a plurality of constituent resin layers.

5. The piezocomposite according to claim 1, wherein each of the sintered piezoelectric thin wires is in a prismatic shape having a polygonal cross section with an average edge length of 10 μm to 500 μm and having a length of 0.05 mm to 3 mm.

6. The piezocomposite according to claim 5, wherein the prismatic shape with a polygonal cross section is a prismatic shape having a trapezoidal cross section.

7. The piezocomposite according to claim 1, wherein the number of the sintered piezoelectric thin wires arranged on one surface of the resin layer is in a range of 10 to 3000.

8. The piezocomposite according to claim 1, wherein the number of the laminated resin layers is in a range of 20 to 1500.

9. The piezocomposite according to claim 1, wherein the number of the

sintered piezoelectric thin wires arranged in a uniform direction in the piezocomposite is in a range of 200 to 4500000.

10. The piezocomposite according to claim 1, wherein a cut surface is ground.

11. The piezocomposite according to claim 1, wherein the sintered piezoelectric thin wires have cut surfaces in the lengthwise direction.

12. An ultrasonic probe for an ultrasonic diagnostic equipment, comprising:

a piezocomposite, obtained by laminating and integrating a plurality of composite sheet units, each of which includes a resin layer and a plurality of sintered piezoelectric thin wires arranged in a uniform direction on a surface of the resin layer, so that the sintered piezoelectric thin wires are positioned between the resin layers, and cutting the same in a direction perpendicular to a lengthwise direction of the sintered piezoelectric thin wires;

electrodes provided on both sides of the piezocomposite;

an acoustic matching layer; and

a backing member,

wherein:

the piezocomposite is interposed between the acoustic matching layer and the backing member; and

one of the electrodes is grounded, while the other electrode is connected as a driving electrode with a transmitting/receiving circuit.

13. An ultrasonic diagnostic equipment, comprising:

an ultrasonic diagnostic equipment main body; and

an ultrasonic probe for an ultrasonic diagnostic equipment, connected with the ultrasonic diagnostic equipment main body,

wherein:

the ultrasonic probe includes:

a piezocomposite, obtained by laminating and integrating a plurality of composite sheet units, each of which includes a resin layer and a plurality of sintered piezoelectric thin wires arranged in a uniform direction on a surface of the resin layer, so that the sintered piezoelectric thin wires are positioned between the resin layers, and cutting the same in a

direction perpendicular to a lengthwise direction of the sintered piezoelectric thin wires;

electrodes provided on both sides of the piezocomposite;

an acoustic matching layer; and

a backing member,

wherein:

the piezocomposite is interposed between the acoustic matching layer and the backing member; and

one of the electrodes is grounded, while the other electrode is connected as a driving electrode with a transmitting/receiving circuit;

and,

the ultrasonic diagnostic equipment main body includes:

a transmitting section and a receiving section that are connected with lines lead from the electrodes on the both sides;

a controlling section connected with the transmitting section and the receiving section;

an image forming section connected with the receiving section and the controlling section; and

an image display device connected with the image forming section.

14. A method for producing a piezocomposite, comprising the steps of:

(a) preparing a molding substrate having a plurality of grooves;

(b) applying to the grooves a paste including a piezoelectric powder and a binder, drying the same, and heating the same so as to remove the binder from a coating film made of the paste;

(c) applying a heat treatment at a higher temperature to sinter the piezoelectric powder, so as to form sintered piezoelectric thin wires;

(d) bonding a resin layer on the sintered piezoelectric thin wires and separating the sintered piezoelectric thin wires from the molding substrate, so as to form a composite sheet unit in which a plurality of the sintered piezoelectric thin wires are arranged in a uniform direction on one surface of the resin layer;

(e) laminating a plurality of the composite sheet units so that the sintered piezoelectric thin wires are positioned between the resin layers; and

(f) integrating the plurality of the composite sheet units thus

laminated.

15. The method according to claim 14, wherein protective layers are formed on surfaces of the grooves of the molding substrate.

16. The method according to claim 14, wherein release layers are formed on the surface of the molding substrate other than the grooves.

17. The method according to claim 14, further comprising a step of impregnating a resin in void portions after the lamination and integration of a plurality of the composite sheet units and curing the same.

18. The method according to claim 14, further comprising a step of cutting the integrated lamination of the composite sheet units in a direction perpendicular to the lengthwise direction of the sintered piezoelectric thin wires, so as to obtain a plurality of piezocomposite pieces.

19. The method according to claim 14, further comprising a step of grinding the piezocomposite along a plane crossing the lengthwise direction of the sintered piezoelectric thin wires in the piezocomposite.

20. The method according to claim 14, wherein the step (e) of laminating the composite sheet units includes a sub-step of providing adhesive resin sheets between the composite sheet units.

21. The method according to claim 14, wherein the step (e) of laminating the composite sheet units includes a sub-step of forming an adhesive layer by coating on at least a part of the resin layer in each composite sheet unit.

22. The method according to claim 14, wherein a technique used for integrating the plurality of the composite sheet units is a technique of impregnating a resin between the composite sheet units and curing the same.

23. A method for producing a piezocomposite, comprising the steps of:

(a) preparing a sintered piezoelectric plate having a thickness ranging from 10 μm to 500 μm;

(b) forming a resin layer on the sintered piezoelectric plate;

(c) forming a plurality of parallel cut grooves in the sintered piezoelectric plate provided with the resin layer, without completely dividing the resin layer, so as to cut the sintered piezoelectric plate into a plurality of sintered piezoelectric thin wires;

(d) repeating the steps (a) to (c) a plurality of times, so as to prepare a plurality of composite sheet units on a surface of each of which a plurality of the sintered piezoelectric thin wires are arranged in a uniform direction;

(e) laminating a plurality of the composite sheet units so that the sintered piezoelectric thin wires are positioned between the resin layers; and

(f) integrating the plurality of the composite sheet units thus laminated.

24. The method according to claim 23, wherein the forming of the plurality of the parallel cut grooves in the step (c) is carried out by at least one selected from the sand-blasting technique and the dicing technique.

25. The method according to claim 23, further comprising a step of impregnating a resin in void portions after the lamination and integration of a plurality of the composite sheet units and curing the same.

26. The method according to claim 23, further comprising a step of cutting the integrated lamination of the composite sheet units in a direction perpendicular to the lengthwise direction of the sintered piezoelectric thin wires, so as to obtain a plurality of piezocomposite pieces.

27. The method according to claim 23, further comprising a step of grinding the piezocomposite along a plane crossing the lengthwise direction of the sintered piezoelectric thin wires in the piezocomposite.

28. The method according to claim 23, wherein the step (e) of laminating the composite sheet units includes a sub-step of providing adhesive resin sheets between the composite sheet units.

29. The method according to claim 23, wherein the step (e) of laminating the composite sheet units includes a sub-step of forming an adhesive layer on at least a part of the resin layer in each composite sheet unit.

30. The method according to claim 23, wherein a technique used for integrating the plurality of the composite sheet units is a technique of impregnating a resin between the composite sheet units and curing the same.

31. A method for producing a piezocomposite, comprising the steps of:

(a) preparing a sintered piezoelectric plate having a thickness ranging from 10 μm to 500 μm;

(b) provisionally fixing the sintered piezoelectric plate on a substrate, by using an adhesive sheet;

(c) forming a plurality of parallel cut grooves in the sintered piezoelectric plate so as to cut the sintered piezoelectric plate into pieces, to obtain a plurality of sintered piezoelectric thin wires;

(d) transferring the plurality of the sintered piezoelectric thin wires provisionally fixed on the substrate;

(e) repeating the steps (a) to (d) a plurality of times, so as to prepare a plurality of composite sheet units on a surface of each of which a plurality of the sintered piezoelectric thin wires are arranged in a uniform direction;

(f) laminating a plurality of the composite sheet units so that the sintered piezoelectric thin wires are positioned between the resin layers; and

(g) integrating the plurality of the composite sheet units thus laminated.

32. A method for producing a piezocomposite, comprising the steps of:

(a) arranging a plurality of sintered piezoelectric thin wires in a uniform direction on a surface of a resin layer, and providing a resin sheet on the sintered piezoelectric thin wires;

(b) integrating the resin layer, the sintered piezoelectric thin wires, and the resin sheet by a process comprising compressing, so that the sintered piezoelectric thin wires are sandwiched between the resin layer and the resin sheet, and that a resin of the resin sheet is deformed so as to fill grooves between the sintered piezoelectric thin wires, thereby forming a composite sheet unit;

(c) repeating the steps (a) and (b) a plurality of times, so as to form a plurality of composite sheet units, each of which is composed of the resin layer, the resin sheet, and the plurality of the sintered piezoelectric thin wires arranged in a uniform direction between the resin layer and the resin sheet;

(d) laminating the plurality of the composite sheet units so that the

sintered piezoelectric thin wires are provided in parallel; and

(e) integrating the plurality of the composite sheet units thus laminated.

33. A method for producing a piezocomposite, comprising the steps of:

(a) preparing two pieces of resin layers on each of which a plurality of sintered piezoelectric thin wires are arranged in a uniform direction;

(b) laminating the two resin layers so that the sintered piezoelectric thin wires provided on a surface of one of the resin layers are positioned between the sintered piezoelectric thin wires provided on a surface of the other resin layer, and integrating the same, so as to form a composite sheet unit;

(c) repeating the steps (a) and (b) a plurality of times, so as to form a plurality of composite sheet units, each of which includes the resin layer, the resin sheet, and the plurality of the sintered piezoelectric thin wires arranged in a uniform direction between the resin layer and the resin sheet;

(d) laminating the plurality of the composite sheet units so that the sintered piezoelectric thin wires are provided in parallel; and

(e) integrating the plurality of the composite sheet units thus laminated.